Computational Modeling
Decay Spectroscopy

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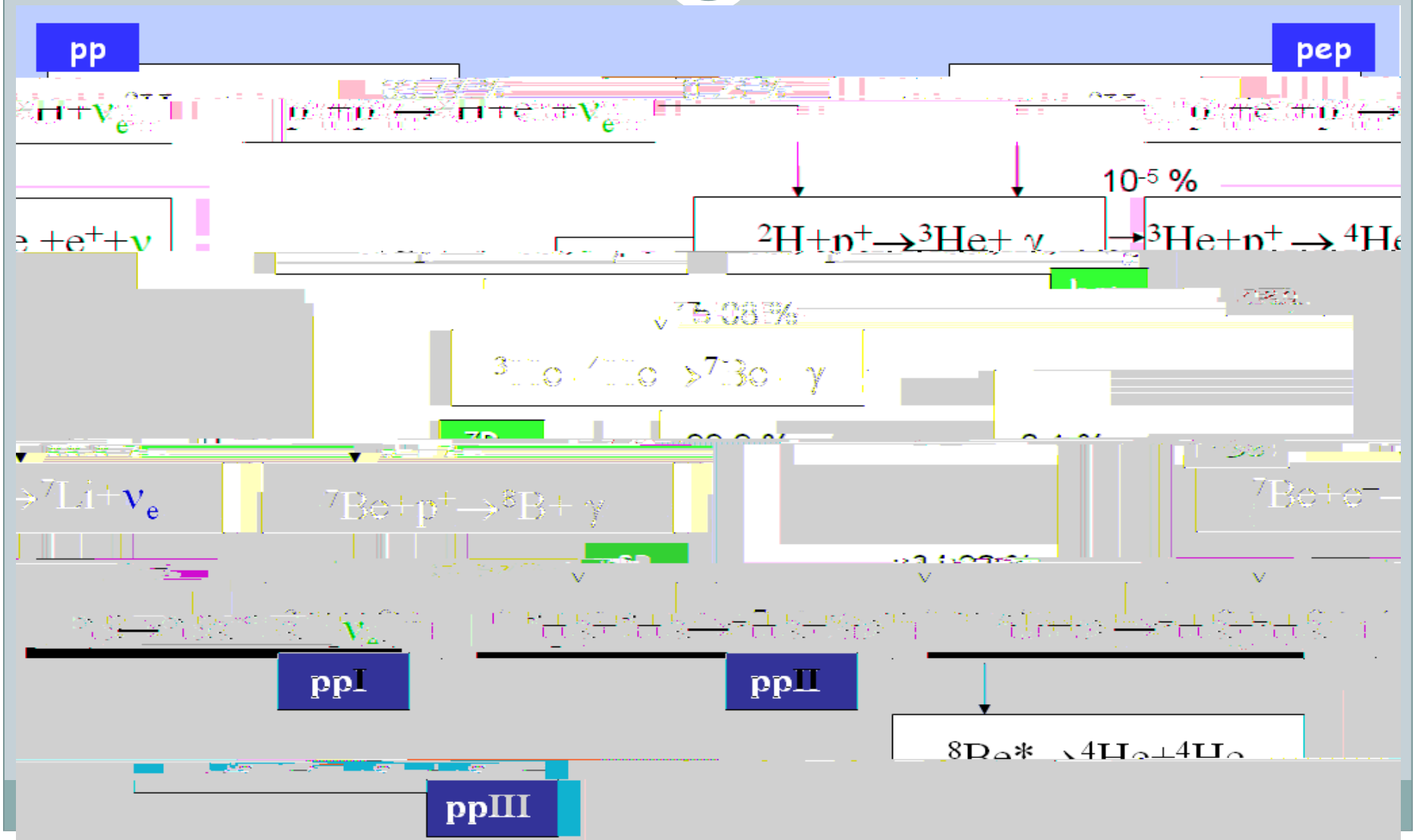
Motivation Solar Reactions



Motivation

Physics Package Used

Electron Gamma Shower national research council (Canada) (EGSnrc)

Monte Carlo Techniques (2)

Each particle has a chance of undergoing various interactions

- Pair production, Compton scattering, etc.

A random number is generated and corresponds to an outcome

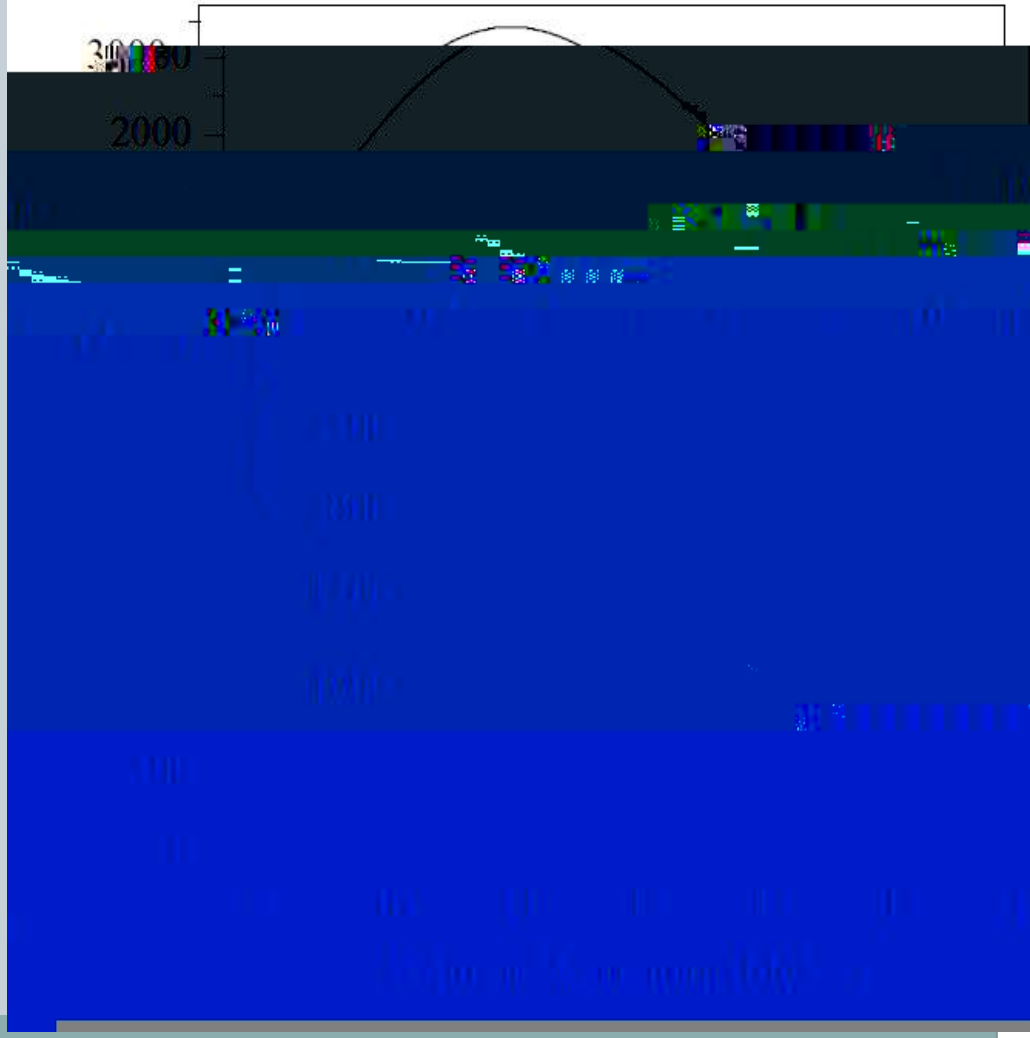
- Any extra particles created are also followed to the cut off energy

To get high accuracy we run lots of particles

- Our simulations require 10^7 to 10^8 source particles

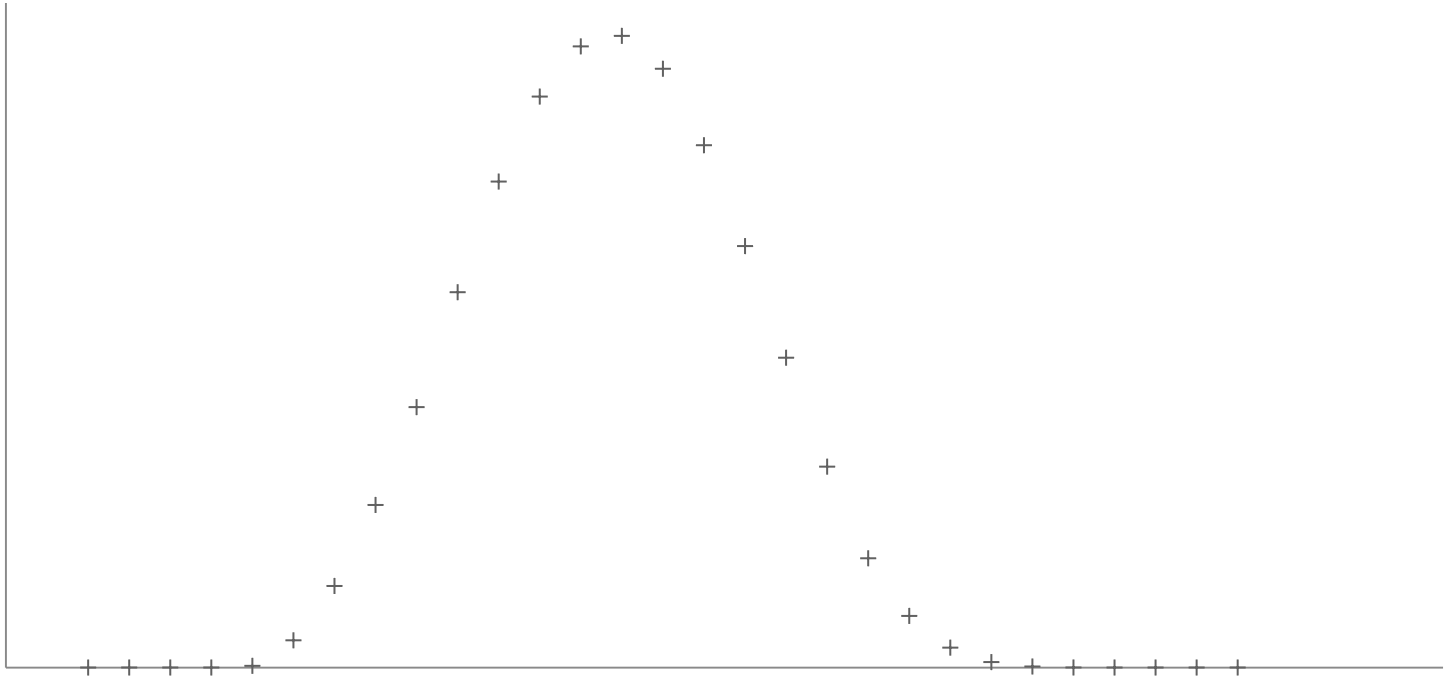
Past Work

Past Measurement

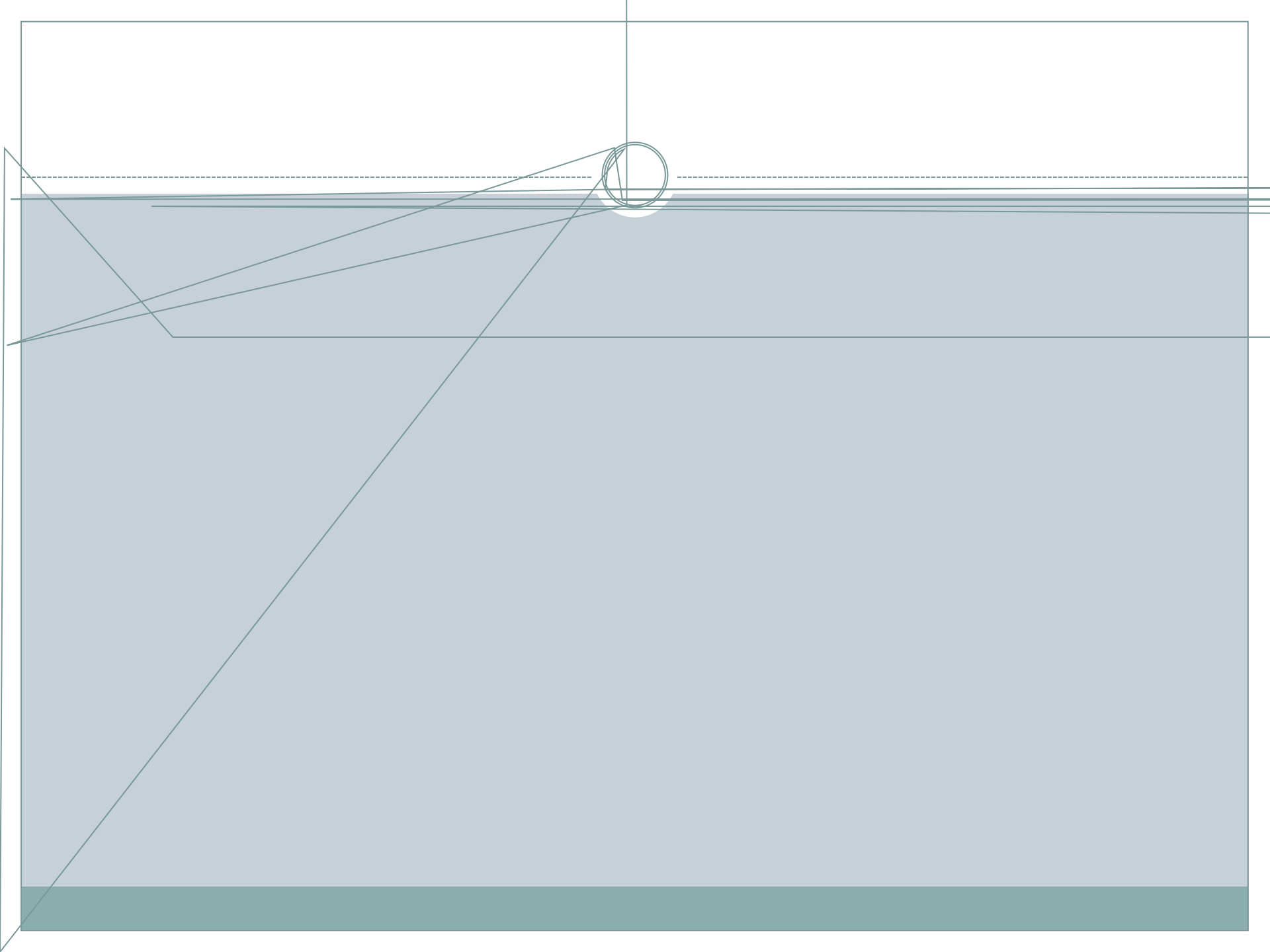


W.T. Winter

EGS Modeling



Response Curve at 12 MeV/c



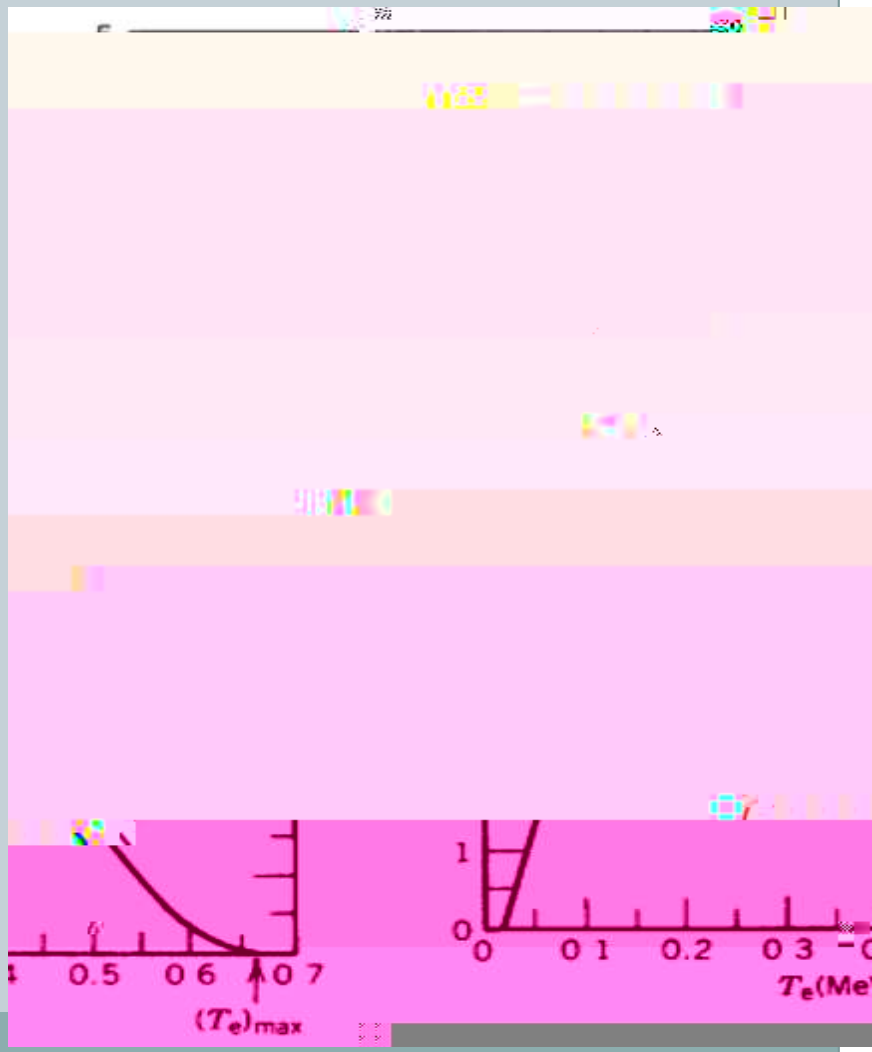
The Fermi Function

Based on Coulomb interaction between emitted particle and positive nucleus

$$F(Z, T_e) = \sqrt{A + \frac{B}{T_e - 1}}$$

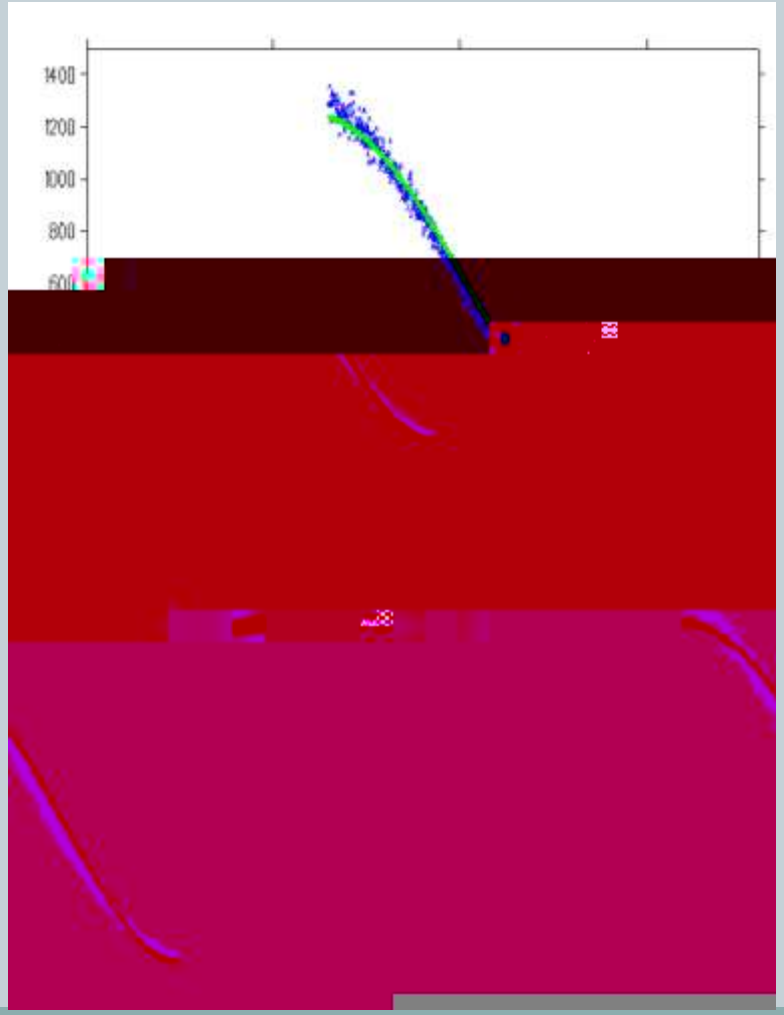
$$A = mZ + K$$

$$B = aZ\, e^{bZ}$$



Comparison of Fits

With Fermi:



Allowed :

Y-Axis: Counts

X-Axis: MeV